

# Course Specification of histology for Master of Hepatobiliary surgery

## A- Administrative Information

**Course Title:** Histology for master of surgery

**Code:** SURG H 712

**Department giving the course:** histology department

**Program(s) on which the course is given:** Master of Hepatobiliary surgery

**Department(s) offering the Program:** Hepatobiliary Surgery department

**Academic year/level:** 1<sup>st</sup> part

**Date of approval by Departmental and NLI Council:** 2011

## B- Professional Information

### 1 – Overall aims of course:

To provide students with knowledge concerning the basic histological structure and ultrastructure of the eukaryotic cell with correlation to biological cellular activities, and basis of cytogenetics and to teach the student the normal histological structure of different tissues of human body in addition to its systems with functional and clinical correlation whenever possible. And to enable students to know the histological structure of various organs and systems of the body.

### a- Knowledge and understanding :

*By the end of the course, student should be able to:*

- a1-Define and describe the structure and functions of the cytoplasmic components.
- a 2-Explain the process of cell division and identify the activities that control the transition from each phase of the cell cycle to the other.
- a3-Know the structural characteristics of the four basic tissue types.
- a4-Describe the functional capabilities of each tissue type and relate them to the structure.
- A5-Describe and compare between different blood elements and their development.
- A6-Define and discuss the basic histological structure of some systems (vascular, lymphatic & nervous).
- A7-Describe the normal histological structure of various body systems (digestive, endocrine, urinary, male & female reproductive).
- a 8-Distinguish structural features of organs, regions and cell types present in" each system and relate the structural variations to differences in organ function.
- A9-Correlate between the blood supply of some organs and their structure and specialized functions.

*b-intellectual skills :By the end of this course, students should be able to*

- B1-Evaluate the structural features and different tissue elements of each organ.
- B2-Draw and label the structures of different organs.
- b3 Recognize and differentiate between types of cells and tissues in histological slides.

*c-professional and practical skills: By the end of the course, student should be able to*

- c1 Select appropriate methods to reveal specific microscopic features of cells and tissues.
- c2 construct structures that could be present in a cell from its function.
- c3 Relate the composition of each tissue type to its specific functions.
- c4 Predict the intracellular or tissue components likely to be involved in a functional deficit.

*d-general and transferable skills: By the end of thin course, students should be able to*

- d1 Appreciate the importance of lifelong learning.
- d2 Use the sources of biomedical information available to remain current with advances in knowledge and practice.

d3 Communicate actively with his colleagues as well as the employees and staff members.

### **3- COURSE CONTENT**

Detailed topics of the course:

#### **2- Cytology**

- Cell membrane (plasma membrane) and glycocalyx (LM & EM, Molecular structure, Functions, Endocytosis and Exocytosis; Receptors and signaling reception).
- Mitochondria (LM & EM, Membrane enzymes, Elementary particles, Mitochondrial DNA & RNA, Functions)
- Ribosomes (LM & EM, Free and attached, Polysomes, chemical composition, Functions)
- Endoplasmic reticulum (Rough & Smooth, LM & EM, Functions)
- Golgi apparatus (LM & EM, Functions)
- Lysosomes (LM, histochemical reactions & EM, Origin, Types and Fate, Functions)
- Centrioles, Cilia and Flagella
- Cytoplasmic inclusions (Stored food, pigments)
- Nucleus of interphase (Nuclear envelope, Chromatin, Nucleolus, Nuclear sap)
- The cell cycle (Interphase G1, S & G2 and mitosis)
- Cell division, Mitosis (Events, Mitotic chromosomes, Mitotic spindle, Phases) & meiosis
- Nucleic acids, DNA & RNA (Chemical composition, Structural differences, nucleotides & genes, codons & anticodons, protein synthesis, transcription, translation, replication & Types of RNA)
- Cell death (necrosis versus apoptosis)

#### **2- Epithelium:**

- General characteristics of epithelium & its types
- Types of simple epithelium (structure & sites)
- Transitional epithelium
- Structure & sites of stratified squamous & stratified columnar epithelium
- Glandular epithelium with reference to sites
- Neuro- and myo-epithelium with reference to sites
- General functions of epithelium
- \_\_\_\_\_ Modifications of epithelial cells surfaces: Apical, basal & lateral modifications
- Basement membrane

#### **3- Connective Tissue:**

- General characteristics
- Cells of C.T. proper (LM, EM & functions)
- Fibers of C.T.
- Ground substance

#### **Cartilage:**

- Types of cartilage
- Histology of each type
- Sites of each type
- General functions

#### **Bone:**

- Types of bone with reference to sites
- Bone cells & their functions
- Histology of compact bone
- Histology of spongy bone

- Differences between cartilage & bone
- Ossification (intramembranous & intracartilagenous)

### **Blood & Hemopoiesis:**

- Components of Blood
- Normal structure, size & number of erythrocytes , ultrastructure & functions
- Abnormalities in structure, size & number of RBCs
- Polycythaemia & anaemia and their causes
- Types of WBCs & normal percentage of each
- Total RBCs count
- Total leucocytic count & its clinical importance
- Differential leucocytic count & its importance
- Types & structure of bone marrow
- Erythropoiesis
- Granulopoiesis
- Development of lymphocytes
- Development of monocytes
- Development of platelets

### **4 - Muscle Tissue:**

- General histological characteristics and types of muscle tissue
- Types of skeletal muscle fibers
- Smooth muscle fibers (LM & EM)
- Cardiac muscle fibers (LM & EM)
- Conducting system of heart

### **5 - Nerve Tissue:**

- Types (classification) of neurons & examples
- Histology of peripheral nerve fibers
- Structure of nerve trunk
- Spinal & autonomic ganglia
- Synapse
- Degeneration & Regeneration of nerve fibers
- Neuroglia (Definition, Classification & Sites )

### **6 - Vascular System:**

- General structure of blood vessels & its significance
- Large, medium sized & small arteries
- Small, medium sized & large veins
- Types, sites & structure of Arteriovenous connections

### **7 - Lymphatic (Immune) System:**

- Cells involved in the immune system & their functions
- Antigen presenting cells
- Primary & secondary immune response
- Cellular & Humoral immunity
- Lymph vessels & distribution of lymphoid tissue
- Structure of Lymph node & its immunological function
- Structure of Spleen & its function
- Differences between lymph node & spleen
- Blood supply of spleen & theories of circulation
- Structure of Tonsils
- Structure & functions of thymus
- Thymic barrier

## **8- DIGESTIVE SYSTEM**

### **ORAL CAVITY**

- Lip

- Tongue & taste buds
- Teeth & gingiva
- Palate and Pharynx

**ALIMENTARY TRACT**

- Oesophagus
- Stomach & gastro-oesophageal junction
- Small intestine & pyloro-duodenal junction
- Large intestine, appendix & Anal canal

**DIGESTIVE GLANDS**

- Salivary glands
- Pancreas
- Liver & gall bladder

**9- URINARY SYSTEM**

- Kidney & blood supply of urineferous tubule
- Blood renal barrier
- Juxta-glomerular complex
- Ureter, Urinary bladder & Urethra

**10 - ENDOCRINE SYSTEM**

- Distribution of endocrine glands
- Pituitary gland
- Suprarenal gland
- Thyroid gland
- Parathyroid gland
- Pineal body
- General characteristics of diffuse neuro-endocrine cells, distribution & function

**11 - MALE GENITAL SYSTEM**

- Testis & blood-testis barrier
- Vasa efferentia. Epididymis, Vas deferens & spermatic cord
- Seminal vesicles, prostate & penis

**12- FEMALE GENITAL SYSTEM**

- Ovary
- Fallopian tube
- Uterus & menstrual cycle
- Placenta
- Vagina & mammary gland

<b>Topic</b>	<b>Theoretical hours</b>	<b>Laboratory/ Practical</b>	<b>Total</b>
<b>Cytology</b>	<b>1</b>	<b>0.5</b>	<b>3</b>
<b>Epithelium:</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>Connective Tissue:</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>Muscle Tissue:</b>	<b>1</b>	<b>0.5</b>	<b>1.5</b>
<b>Nerve Tissue:</b>	<b>1</b>	<b>0.5</b>	<b>1.5</b>
<b>Vascular System Lymphatic</b>	<b>1</b>	<b>1</b>	<b>2</b>

<b>(Immune) System:</b>			
<b>DIGESTIVE SYSTEM</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>URINARY SYSTEM</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>ENDOCRINE SYSTEM</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>MALE GENITAL SYSTEM</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>FEMALE GENITAL SYSTEM</b>	<b>1</b>	<b>0.5</b>	
<b>Total hours</b>	<b>11</b>	<b>9</b>	<b>20</b>

#### **4- Teaching and learning methods**

4.1 Lectures: for acquisition of knowledge

#### **5- Student assessment methods**

5.1 final written and oral exams

#### **Assessment schedule**

One and half hours written paper +oral exam

#### **Weighting of assessments**

Final-term written examination 50 %

Oral examination 25%

Total 100%

#### **6- List of list of references:**

6.1 Course note:

Department elementary books

6.2- Essential Books (Text Books)

-Junqueira, Carneino and Kelly (1995): Basic Histology, 7th ed.Librairie du liban and lang buruit,London,New York.

-Fawcett(1994):A Text Book of Histology,12th ed.Chapman and Hall,New York,London.

- Drury,R.A.B. and Walington,E.A.(1980): Histological techniques,5th ed.Oxford university press,New York.

-Pears,A.G.E.(1985): Histochemistry theoretical and applied,4th ed.Churchill Livingstone,Melbourne and New York.

6.3- Recommended Books

- Cormack,H.D.(1987): A text book of Histology,9th edition, Lippincott,J.B. Company, Philadelphia.

6.4- Web Sites:

www.yahoo.com

[www.pubmed.com](http://www.pubmed.com)

#### **7- Other Resources / Facilities required for teaching and learning to achieve the above ILOs**

1-NLI Lecture halls

2-NLI library can be used for projects and textbooks

3-Audiovisual aids as: writing boards and over head projectors.

**Course coordinator:**

**Name:** Prof. Dr. Gamal ElBadawy Hagraš  
**Signature**  
**Head of the department of Histology:**